A series of ancient wreaths and plant remains from the cemetery of Hawara, Egypt, exhibited by Mr. Percy E. Newberry, by permission of the Director of the Royal Gardens, Kew. These wreaths and plant remains were discovered last year by Mr. Flinders Petrie, in coffins of the Ptolemaic period, and date from about the first century before Christ. They are fully described by Mr. Percy E. Newberry, in Mr. W. M. Flinders Petrie's "Hawara, Biahmu, and Arsinoë," and were presented to Kew some few months since.

Gramme ring, rotating under the influence of the magnetism of the earth, exhibited by Mr. J. Wilson Swan. It is a motor of the type of the ordinary dynamo-electric machine, but without field magnets other than the north and south magnetic poles of the earth. The current passing in the ring is about half an ampere.

Preparations of the new element gnomium, recently discovered by Gerhard Krüss and F. W. Schmidt, of Munich, exhibited by Dr. Hugo Müller, F.R.S. Gnomium oxide; gnomium chloride (in aqueous solution); nickel from which the gnomium, which up to the present always accompanied it, has been separated; nickel oxide free from gnomium. Gnomium is a metallic element which, according to the discovery of Krüss and Schmidt, is always associated with cobalt and nickel, and consequently neither of these metals have up to the present been known in the pure state.

Illustrations of the new and the old astronomy, exhibited by Mr. Isaac Roberts. Among these was the photograph of the nebula 51 M. Canum Venaticorum; the original negative being shown under the microscope.

Mr. H. J. Chaney showed a hollow cylinder and sphere, used in the re-determination of the weight of a cubic inch of distilled water, 1889. $t = 62^\circ$, $B = 30$ inches. One cubic inch $=$ 252·286 grains.

Voltaic balance, exhibited by Dr. G. Gore, F.R.S. Used for measuring voltaic energy in chemical analysis; strength of aqueous solutions; effect of light and heat on aqueous solutions; detecting chemical changes in liquids and measuring their rates: detecting chemical compounds and their combining proportions; measuring losses of voltaic energy during chemical combination; measuring chemical energy. By means of it the influence of 1 part by weight of chlorine in 500,000 million parts by weight of water has been detected.

Films of metals and metallic oxides deposited by electric sparks, exhibited by Prof. W. N. Hartley, F.R.S.

Hair from the Yenisei Mammoth, obtained by F. Schmidt, of the Academy of Sciences, St. Petersburg, exhibited by Prof. G. H. Seeley, F.R.S.

Drawings illustrating the feeding of Scrobiculariæ, exhibited by Dr. H. C. Sorby, F.R.S. The feeding of Scrobiculariæ, as also of Tellinæ, is by actively taking in mud by the indraught syphon and afterwards discharging it by the same, unlike the quiet habit of most other Conchifera.

Mr. J. Young showed—(1) a cluster of nests of a species of Swift (Collocalia) taken in one of the Society Islands; (2) a specimen of *Pluvianellus sociabilis*, a plover obtained in South America, of which only two specimens (obtained fifty years ago) were previously known in Europe; (3) the tail of a Japanese barndoor cock, 11 feet long.

Mr. W. H. Preece, F.R.S., exhibited—(1) calcedonified tree-trunk, from Arizona, U.S.A.; (2) transverse, tangential, and radial microscopical sections of the wood, to illustrate the original vegetable structures and the mineralogical changes which have taken place during and subsequently to the silicification of the woody tissues.

Egyptian blue ("Vesterien") artificially prepared by Prof. F. Fouqué, of the Collège de France, Paris, exhibited by Prof. J. W. Judd, F.R.S. This substance is shown to have the formula $CaO, CuO, 4SiO$. It has been obtained, not only in a glassy form, but in crystals, which are remarkable for their intense pleochroism (dark blue to rose pink), as was shown in specimen under microscope. For comparison specimens of ancient objects (Scarabei and ornaments used in mosaic work) were exhibited by Mr. R. H. Soden Smith, to illustrate the method in which this blue enamel was employed by the Egyptians. Other specimens of antique ornaments glazed with the Egyptian blue, exhibited by Mr. John Evans, Treasurer of the Royal Society.

A revolving stage for the microscope, exhibited by Prof. R. J. Anderson.

Prof. H. Marshall Ward, F.R.S., exhibited various parasitic fungi, and specimens of diseased timber showing characteristic symptoms of injury caused by them. The chief of these are:—(1) piece of larch stem, affected with the "larch disease," and exhibiting the cups of *Peziza* (*Helotium*) *willkommii* on the cancerous cortex; (2) specimen of fructification of *Polyporus sulphureus*; (3) piece of larch timber attacked by *Polyporus sulphureus*, showing the characteristic symptoms of the injury; (4) piece of oak timber, exhibiting the characteristic symptoms of disease due to the ravages of *Stereum hirsutum*; (5) piece of oak attacked by *Thelephora perdix*, showing the very different mode of injury due to this fungus; (6) piece of spruce fir, attacked by the mycelium of *Trametes radiciperda*, and exhibiting the very characteristic dark spots which serve to diagnose the disease; (7) piece of pine injured by *Agaricus melleus*, and showing the very different symptoms which betray the presence of this fungus; (8) piece of deal with grey mycelium of *Merulius lacrymans*, causing the common "dry rot" of timber; and a similar piece of timber attacked by the white mycelium of *Polyporus vaporarius*, another and quite different fungus, which produces a form of "dry-rot"; (9) portion of pine stem infected with *Peridermium pini*, the Æcidium form of *Coleosporium senecionis*,—the other form of this parasite is found on various species of groundsel (it does much damage to the pines in some forests, producing so-called "cankers" as disastrous as those of the "larch disease"); (10) specimen of wheat infested by *Ustilago carbo* (*U. segetum*), showing the destruction of the ears by the fungus, the black spores of which completely occupy the interior of the grain; (11) specimen of grass attacked by *Epichloe typhina*, a destructive ascomycetous fungus which infests the flowering shoots of pasture grasses; (12) culture specimens of *Sclerotia* developed from species of *Botrytis*, which destroy certain garden plants. Microscopic preparations of these are also exhibited.

Models illustrating a cause of contortions of strata, exhibited by Dr. Charles Ricketts. To induce these flexures, dry and powdered clay of different colours is spread in consecutive layers in a trough, when by the access of water, the clay becomes plastic, sand is poured on some special part, its weight in the experiment being supplemented by extra pressure; this causes the heavier substance to subside into the plastic mass; at the same time the clay-beds are squeezed outwards, the layers underneath being formed into films still continuous with those at the sides, which are rendered considerably thicker than in their original state, and are curved into folds, representing on a small scale such as frequently occur in stratified rocks. The experiment so exactly coincides with natural phenomena that it is reasonable to expect it will afford a true explanation of a frequent cause of contortion, and also of cleavage of strata (see "On some Physical Changes in the Earth's Crust, Part 3," *Geological Magazine*, April 1889, p. 165).

Amorphophallus campanulatus, exhibited by the Director of the Royal Gardens, Kew.

New optical apparatus for lecture demonstration, invented and exhibited by Mr. Eric Stuart Bruce:—(1) Apparatus for projecting Crookes's radiometer in action on the screen, so as to render its effects visible to large audiences.—(2) "The electro-graphoscope." A striking method of showing the illusions produced by persistence of vision to large audiences. In this apparatus a narrow lathe of wood, about an inch wide, is made to revolve rapidly by means of an electric motor, the effect being an almost invisible haze, but when the revolving lathe is placed in the path of the rays of light proceeding from an oxyhydrogen lantern, in which there is a transparent picture or photograph, the image is apparently cast upon the air, in the case of a statue giving the effect of bold relief. In reality minute portions only of the image are cast upon the revolving plane, in such rapid succession that they are united into the perfect whole by the retentive action of the retina of the human eye.

Mr. Eadweard Muybridge exhibited projections by the electric lantern of automatic electro-photographs, exposed at regulated intervals of time, illustrating the consecutive phases of bipedal locomotion, as synchronously viewed from two or more points of sight.

SCIENTIFIC SERIALS.

American Journal of Science, May.—The electrical resistance of stressed glass, by Carl Barus. Following up Warburg's experiments, which have thrown so much new light on the thermal relations of the resistance of glass, the author here deals specially

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with the effects of stress on electrolyzing glass kept as nearly as possible at different constant temperatures between 100° and 360°. He finds generally that a solid electrolyte like glass is a better conductor of electricity when in a state of strain or torsion than when free from strain. The influence of temperature in changing the value of the electrolytic effect of stress is not marked; the same pull per unit section does not apparently increase the conductivity of glass more at 350° than at 100°, if indeed it increases it as much.—On the formation of siliceous sinter by the vegetation of thermal springs, by Walter Harvey Weed. These researches on the origin of the deposits of siliceous sinter found in the basins of the Yellowstone National Park make it evident that such deposits are largely formed by the vegetation of the hot spring waters. Waters too poor in silica to form sinter deposits by any other cause may be accompanied by beds of siliceous sinter formed by plant life; the extent and thickness of these deposits establish the importance of this form of life as a geological agent.—Marine shells and fragments of shells in the Till near Boston, by Warren Upham. These fossils, occurring in drift deposits near Boston, are usually regarded as evidence of a marine submergence within the Pleistocene or Quaternary period. But Mr. Upham's observations made last year show that they were transported from the bed of the sea on the north by the ice-sheet in the same manner as the materials of the drift have been carried southwards and often deposited at higher elevations than the localities from which they were brought. Hence these shells afford no proof of the former presence of the sea at the level where they are now found.—A platiniferous nickel ore from Canada, by F. W. Clarke and Charles Catlett. The careful analysis here made of these ores from the mines at Sudbury, Ontario, places beyond all doubt the presence of platinum in appreciable quantities. It probably exists in the ore as sperrylite, though this point has not yet been determined.—Stratigraphic position of the Olenellus fauna in North America and Europe, by Chas. D. Walcott. The general result of these researches is to remove the Olenellus fauna both in the Old and New World from the Middle Cambrian to the base of the whole Cambrian system. The paper, which is not concluded, gives full tables of this fauna, with its areas of geographical distribution east and west of the North Atlantic.—Earthquakes in California, by Edward S. Holden. The statistics of seismic disturbances in this region with incidental remarks are brought down to the end of the year 1888.—Chemical action between solids, by William Hallock. In his recent note on a new method of forming alloys, the author undertook to carry out some additional experiments, the results of which are here given. He infers generally that chemical action may take place wherever the products are liquid or gaseous, even though the reagents are solid, with perhaps the added condition that one or both reagents be soluble in the liquid produced.

Revue d'Anthropologie, troisième série, tome iv., deux^{e}. fasc. (Paris, 1889).—On the colour of the eyes and hair of the Aïnos, by M. Lefèvre. These notes were drawn up at the suggestion of Dr. Colignon, while the author was acting as Professor at the Military College of Japan. The principal point commended to his notice was to determine whether there was any foundation for the statement, made by various travellers, that many of the Aïnos present the anomalous condition, that while the hair of the head is red, the beard, and the hair with which various parts of their bodies are profusely covered, are deep black, the skin being sallow, and the eyes light. This coloration is completely at variance with all known physiological relations, and it is obvious from the author's observations that the statement must have arisen from a misconception, due, perhaps, in part to the practice pursued by the Aïnos of colouring their heads a bright red, and tattooing the lips in circular rings of black and blue. The interest of racial coloration is considerable when judged from an ethnological point of view, and special importance attaches to the subject in regard to the Aïnos, who, although undoubtedly a white race, have undergone various modifications in accordance with the different parts of the empire in which they were settled. Thus, while in some districts the people have been forced to adopt the dress and habits of the Japanese, in the neighbourhood of Sapporo, the capital of the Island of Yesso, they have hitherto been enabled to retain their old customs, and keep themselves far more free than elsewhere from intermixture with the Japanese. It is, therefore, the more worthy of notice that in this district no blonde or blue-eyed Aïnos are to be met with, while the people generally have absolutely black hair. It would, in fact, appear that the hair of the normal Aïnos is of a jay-like blackness, coarse and stiff, but bright and lustrous, although in the case of a few of those who have long occupied the sea-coast, the hair is of a dark brown, presenting almost the same softness as that of Europeans. In no section of the people is there the slightest evidence of any anomalous colouring of the hair, eyes, and complexion. M. Lefèvre considers that the stature of the Aïnos is somewhat higher than that of the normal Japanese, while their cranial index, which is found to range from the extremes of dolichocephalism to that of brachycephalism, would seem to give very strong weight to the assumption that these people are not a pure race, and that they differ in accordance with the extent to which Mongolian or other ethnic elements have modified their primitive character.—On the writings and opinions of Samuel Zarza, by M. Salomon Reinach. Considerable interest was excited by a statement made in 1877 by Dr. Topinard, in one of his lectures, afterwards published in the *Gazette Médicale*, according to which a Jew, named Samuel Zarza, was burnt alive in 1450, for having maintained the antiquity of man. This statement excited much attention, and M. Cartailhac, who doubted its accuracy, appealed to his *confrères* for information in regard to the documents from which M. Topinard had quoted. This appeal remained unanswered until the question was lately taken up by M. Reinach, who associated with himself in the necessary investigations a learned Russian Jew, M. Salomon Fuchs. To the latter we are indebted for a commentary on the numerous works of Zarza, surnamed Ben S'né, which, according to his own report, were undertaken in the hope of reviving among his co-religionists in Spain their interest in philosophical and theological inquiries, which had nearly died out amid the miseries they had endured during the civil wars between Peter the Cruel and his brother, Henry II. M. Fuchs has failed to find in these works any opinion expressed concerning the antiquity of man, although the writer appears to have adhered to the belief of the eternity of the world. It is, moreover, obvious from his reference to his age when he completed his second work, entitled "Mikhalal-Yophi," *i.e.* "Perfection of Beauty," in 1369, that he could not have survived until 1450, which is given by the commentators of the seventeenth century, from whom Dr. Topinard borrowed his references, as the date of his presumed martyrdom. While M. Fuchs thus supplies another proof of the inaccuracy of many of the earlier commentators, he at the same time shows by his summary of Zarza's writings that Hebraists might throw interesting light on the early dawn of scientific inquiry by a careful study of the numerous still unprinted remains of Zarza, and of his Spanish co-religionists, who undoubtedly exercised an active influence on the progress of learning in the Middle Ages.—On the belief in familiar household spirits and other forms of superstition, by Dr. Berenger-Feraud. The interest of this paper to the student of folk-lore depends upon the writer's detailed narratives of the local superstitions still prevailing, or only recently exploded, in the rural districts of France; his elaborate exposition of the superstitions of other countries has little value for the English reader.—On questions regarding the Aryans, by M. de Lapouge. The author believes that, at the present stage of our knowledge, we are justified in assuming that in the ancient Aryans we have a blonde dolichocephalic race, whose cradle was in the north-west of Europe as it existed in the second half of the Quaternary age.—On the steatopygia of the Hottentots in the Garden of Acclimatization by M. Topinard.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 7.—"On the Wave-Length of the Principal Line in the Spectrum of the Aurora." By William Huggins, D.C.L., LL.D., F.R.S.

I think it is very desirable that I should put on record some observations of the spectrum of the aurora which I made in the year 1874, but which, up to the present time, have remained unpublished. These observations were made with a powerful spectroscope, and under conditions which enabled me to determine the wave-length of the principal line within narrow limits of error. The spectroscope was made by Sir Howard Grubb, on the automatic principle of his father, Mr. Thomas Grubb. It is furnished with two "Grubb" compound prisms; each has 5 square inches of base, and gives nearly twice the dispersion of a single prism of 60°—namely, about 9° 6′ from A to H.

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